

Taiwanese Patent Publication No. 212343

The present invention relates to a structure that can provide quick replacement for a screwdriver (50) of a socket wrench (10). A semi-circular slit (121) is defined in the head (12) of the socket wrench (10). The semi-circular slit (121) does not extend through the head (12) of the socket wrench (10). The semi-circular slit (121) receives a pawl (20) and a switch (30). An aperture (12) is defined in the semi-circular slit (121) for receiving a spring (S1) and a ball (R1). A concave rear side (21; 22) and a toothed front side (23; 24) are defined in the pawl (20). The pawl (20) is in a position where the concave rear side (21) is engaged with the ball (R1), the toothed front side (24) with the toothed side (52) of the screwdriver (50). As the switch (30) is rotated counterclockwise, the pawl (20) is stuck between the head (12) and the toothed side (52) of the screwdriver (50). As the switch (30) is rotated clockwise, the concave rear side (22) is engaged with the ball (R1), the toothed front side (23) with the toothed side (52) of the screwdriver (50) so that the pawl (20) is stuck between the head (12) and the toothed side (52). A square slot (54) is defined in the toothed side (52) for receiving a spring (70) and dent (80). The concave side (62) is defined in the stick (60). The stick (60) is in a position where the concave side (62) is engaged with the spring (62) causes the dent (80) is descending, thus disengaging the dent (80) from a circular groove (125) of the head (12). As the concave side (62) is disengaged with the spring (62), the dent (80) ascends, thus engaging the dent (80) with a circular groove (125) of the head (12) so as to adapt to various specification of the screwdriver (50) for quick replacement.

CONFIDENTIAL –
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HU 051431

QUICK-RELEASE STRUCTURE FOR A RATCHETING D-HEAD OF A RATCHETING WRENCH

The present invention relates to a quick-release structure for a ratcheting D-head of a ratcheting wrench, and, more particularly, to a ratcheting D-head that can be detached and replaced quickly, allowing use of different specifications and different sizes such that the user may carry a single ratcheting wrench and optionally replace the ratcheting D-heads of various types, providing wider applications of the ratcheting wrench and convenience.

Background of the Invention

10 A typical ratcheting wrench available on market includes a ratcheting D-head that is fixed in shape and structure. Thus, the user must carry many ratcheting wrenches of different specifications and sizes for different work needs, which is inconvenient to carriage. Further, the ratcheting D-head cannot be easily removed from the ratcheting wrench for maintenance purposes, resulting in
15 rusting of and damage to the ratcheting D-head and shortening the life of the ratcheting wrench.

In view of these problems, the inventor of the present application having many years of experience in the manufacturing and production of the ratcheting wrenches and having proceeded with development and research as well as
20 innovation in this regard is intended to provide a quick-release structure for a ratcheting D-head of a ratcheting wrench to solve these problems of the conventional ratcheting wrenches.

Embodiment of the Invention

An embodiment of the present invention will now be described with
25 reference to the accompanying drawings to enable one skilled in the art to understand the structure of the present invention and the function to be achieved by the present invention.

A quick release structure for a ratcheting D-head of a ratcheting wrench, as shown in Fig. 1 illustrating an exploded perspective view of a ratcheting
30 wrench in accordance with the present invention, includes a ratcheting wrench 10,

a head 12, a pawl 20, a switch member 30, a C-clip 40, a spring S1, a ball R1, a ratcheting D-head 50, a compression spring S2, a positioning ball R2, a push rod 60, a return element 70, and a positioning block 80.

The ratcheting wrench 10 includes a handle 11 for grip and a head 12 for receiving elements. The head 12 includes a circular groove 121 I a side thereof, wherein the circular groove 121 does not extend throughout the head 12. A spring-receiving receptacle 122 is defined in a bottom wall delimiting the circular groove 121. The head 12 further includes an axial hole 123 extending throughout a central portion thereof. The axial hole 123 has a stepped portion 124 for receiving a flange 55 of the ratcheting D-head 50 (see Fig. A-A). Further, the axial hole 123 has a bottom portion communicated with the circular groove 121, and an annular groove 125 is defined in a peripheral wall delimiting the axial hole 123.

The pawl 20 is a symmetric block having symmetric left and right portions. The pawl 20 further includes two arcuate sides the bottom sides of which include left and right ball-retaining grooves 21 and 22 that are contiguous to each other. The pawl 20 further includes ratcheting teeth 23 for clockwise rotation and ratcheting teeth 24 for counterclockwise rotation respectively on two upper corners of two arcuate side portions thereof, with an arcuate face 25 being located between the ratcheting teeth 23 and the ratcheting teeth 24. Further, a slot 26 is defined in a central portion of the pawl 20.

The switch member 30 is disc-like and sized to cover the circular groove 121 of the ratcheting wrench 10. An elongated protrusion 32 projects outward from a side of the switch member 30 and is engaged in the slot 26 of the pawl 20. A turn piece 32 extends downward from the other end face of the switch member 30 for switching the pawl 20 to a left, right, or central position. The disc further includes an annular groove 33 in an outer periphery thereof.

The spring S1 has proper resilience and is directly mounted into the spring-receiving receptacle 122 of the ratcheting wrench 10.

The ball R1 is placed on the spring S1 and presses against the left ball-retaining groove 21 or the right ball-retaining groove 22 of the pawl 20.

After the spring S1, the ball R1, the pawl 20, and the switch member 30 are mounted in sequence into the spring-receiving receptacle 122 and the circular groove 121 of the ratcheting wrench 10, the C-clip 40 is engaged in the annular groove 33 of the switch member 30, providing a retaining function.

5 The ratcheting D-head 50 has a drive column 51 on a front end thereof, the drive column 51 having different specifications and sizes. A relatively larger ratchet wheel 52 having a fixed specification and a fixed size is provided on an intermediate portion of the ratcheting D-head 50. The ratcheting D-head 50 further includes an axial hole 53 in a center thereof, and a flange 55 is formed on
10 a rear end of the ratcheting D-head 50. Further, a square hole 54 extends through a periphery of the ratchet wheel 52.

 The push rod 60 is a stepped rod and includes a ball-receiving groove 61 in a rear end thereof. An arcuate groove 62 is defined in an intermediate portion of the push rod 60 and aligned with the square hole 54 of the ratchet wheel 52.
15 The rear end of the push rod 60 is enlarged to form a knob 63 for manual turning.

 The return element 70 is slightly resilient and is mounted in the square hole 54 of the ratchet wheel 52. When the push rod 60 is turned, the return element 70 is moved upward or downward along the arcuate groove 62 of the push rod 60.

20 Formed on a lower end of the positioning block 80 is a rod 81 that extends through the return element 70. The positioning block 80 further includes a protruded portion 82 on an upper end thereof. The protruded portion 82 is engaged in or disengaged from the groove 125 of the ratcheting wrench 10, depending from upward or downward movement of the return element 70.

25 A quick-release structure for a ratcheting D-head of a ratcheting wrench is provided by means of assembling the above-mentioned elements. Figs. 2 through 4 respectively show prohibition of clockwise rotation of the ratcheting D-head, prohibition of counterclockwise rotation of the ratcheting D-head, and free rotation of the ratcheting D-head. The user may switch the turn piece 32 of he
30 switch member 30 leftward or rightward, causing one of the left and right ball-retaining grooves 21 and 22 to be selectively engaged with the ball R1. Thus,

either ratcheting teeth 23 for clockwise rotation or ratcheting teeth 24 for counterclockwise rotation are engaged with the ratchet wheel 52, prohibiting the ratchet wheel 52 to turn in either the clockwise direction or the counterclockwise direction. In a case that the pawl 20 is in the middle position, the ratcheting D-head 50 is not restrained, allowing the user to detach and replace the ratcheting D-head 50.

The ratcheting D-head in Fig. 5 is retained in place, and the ratcheting D-head in Fig. 6 is to be removed from the ratcheting wrench. When replacing of the ratcheting D-head 50 of a different specification and a different size is required, the knob 63 of the push rod 60 is turned until the arcuate groove 62 is aligned with the return element 70. At this time, due to the space provided by the arcuate groove 62, the return element 70 and the positioning block 80 synchronously move downward such that the positioning block 80 is disengaged from the groove 125 of the ratcheting wrench 10, allowing easy removal of the whole set of the ratcheting D-head 50 and replacement of another ratcheting D-head of a different specification and a different size (including the whole set of ratcheting D-head 50, push rod 60, return element 70, and positioning block 80). When installing the another whole set of the ratcheting D-head 50, the return element 70 and the positioning block 80 are adjusted to be aligned with the arcuate groove 62 of the push rod 60 such that the positioning block 80 is completely inside the ratchet wheel 52, allowing the whole set of the ratcheting D-head 50 to be inserted into the axial hole 123 and the stepped portion 124 of the ratcheting wrench 10. Finally, the knob 63 of the push rod 60 is turned to cause the arcuate groove 62 to disengage from the return element 70. The return element 70 is pressed against by the intermediate portion of the push rod 60 and thus moves upward, which urges the positioning block 80 into the groove 125 of the ratcheting wrench 10. The assembly is thus completed.

According to the above description, the quick-release structure for a ratcheting D-head of a ratcheting wrench in accordance with the present invention is provided. It has been manufactured and repeatedly tested, and the results showed that the following functions can be achieved:

1. The user may carry only one ratcheting wrench and a plurality of ratcheting D-heads of different specifications and different sizes for different use. The burden of carriage to the user is mitigated, and the application range of the ratcheting wrench is increased.

- 5 2. The ratcheting D-head can be replaced by the user without any tool. Detachment and replacement of the ratcheting D-head can be accomplished easily.

10 The inventor of the present invention has investigated the market and found no similar products. Thus, the present invention is a first invention and possesses utility and improvement, which meets the requirement of Article 95 of the Patent Law. An application for patent is filed accordingly.

Brief Description of the Drawings

Fig. 1 is an exploded perspective view of a ratcheting wrench in accordance with the present invention.

Fig. 2 is a schematic view of the ratcheting wrench, wherein clockwise rotation of the ratcheting D-head is prohibited.

Fig. 3 is a schematic view of the ratcheting wrench, wherein counterclockwise rotation of the ratcheting D-head is prohibited.

Fig. 4 is a schematic view of the ratcheting wrench, wherein the ratcheting D-head is allowed to rotate freely.

Fig. 5 is a sectional view of the ratcheting wrench, wherein the ratcheting D-head is retained in place.

Fig. 6 is a sectional view of the ratcheting wrench, wherein the ratcheting D-head is to be removed from the ratcheting wrench.

Number List

15	10 ratcheting wrench	11 handle
	12 head	121 circular groove
	122 spring-receiving receptacle	123 axial hole
	124 stepped portion	125 groove
	20 pawl	21, 22 ball-retaining groove
20	23, 24 ratcheting teeth	25 arcuate face
	26 slot	
	30 switch member	31 elongated protrusion
	32 turn piece	33 annular groove
	S1 spring	
25	R1 ball	
	40 C-clip	
	50 ratcheting D-head	51 drive column
	52 ratchet wheel	53 axial hole
	54 square hole	55 flange
30	60 push rod	61 ball-receiving groove
	62 arcuate groove	63 knob

70 return element

80 positioning block

81 rod

82 protruded portion

Claims:

1. A quick release structure for a ratcheting D-head of a ratcheting wrench, comprising a ratcheting wrench, a pawl, a switch member, a C-clip, a spring, a ball, a ratcheting D-head, a compression spring, a positioning ball,
5 a push rod, a return element, and a positioning block, characterized in that:

the ratcheting wrench includes a head having a circular groove in a side thereof, the circular groove does not extend throughout the head and receive the pawl; and the switch member, a spring-receiving receptacle is defined in a bottom wall delimiting the circular groove for receiving the
10 spring and the ball, the head further includes an axial hole extending throughout a central portion thereof, the axial hole has a stepped portion for receiving the ratcheting D-head, the axial hole further has a bottom portion communicated with the circular groove, and an annular groove is defined in a peripheral wall delimiting the axial hole;

15 the pawl includes symmetric left and right portions, the pawl further includes two arcuate sides two arcuate sides the bottom sides of which include left and right ball-retaining grooves that are contiguous to each other, the pawl further includes ratcheting teeth for clockwise rotation and ratcheting teeth for counterclockwise rotation respectively on two upper
20 corners of two arcuate side portions thereof, with an arcuate face being located between the ratcheting teeth and the ratcheting teeth, a slot is defined in a central portion of the pawl;

the switch member covers the circular groove of the ratcheting wrench, an elongated protrusion projects outward from a side of the switch
25 member and is securely engaged in the slot of the pawl, a turn piece extends downward from the other end face of the switch member for switching the pawl to a left, right, or central position, the switch member further includes an annular groove in an outer periphery thereof for receiving a C-clip;

the ratcheting D-head has a drive column on a front end thereof,
30 the drive column has different specifications and sizes, a relatively larger ratchet wheel having a fixed specification and a fixed size is provided on an

intermediate portion of the ratcheting D-head, a flange is formed on a rear end of the ratcheting D-head and mounted in the stepped portion of the ratcheting wrench, the ratcheting D-head is engaged with the pawl, the ratcheting D-head further includes an axial hole in a center thereof for receiving the compression spring, the positioning ball, and the push rod, a square hole extends through the periphery of the ratchet wheel, is aligned with the groove of the ratcheting wrench, and receives a return element and a positioning block;

the push rod is a stepped rod, an arcuate groove for receiving the return element is defined in an intermediate portion of the push rod and aligned with the square hole of the ratchet wheel, an enlarged knob is formed on an end of the push rod for manual turning.

2. The quick release structure for a ratcheting D-head of a ratcheting wrench as claimed in claim 1, wherein the pawl is moved via leftward/rightward turning of the switch member to cause the ratcheting teeth for clockwise rotation or the ratcheting teeth for counterclockwise rotation to move upward and to restrain clockwise rotation or counterclockwise rotation of the ratchet wheel, and wherein when the pawl is in the central position, the ratcheting D-head is freely rotatable and removable.
3. The quick release structure for a ratcheting D-head of a ratcheting wrench as claimed in claim 1, wherein the return element and the positioning block move upward or downward in response to rotational movement of the arcuate groove of the push rod such that the positioning block is moved upward to an engage state or moved downward to a disengaged state, thereby retaining the ratcheting D-head in the groove of the head of the ratcheting wrench or disengaging the ratcheting D-head from the groove of the head of the ratcheting wrench.

Abstract

The present invention provides a quick release structure for a ratcheting D-head of a ratcheting wrench, characterized in that: the ratcheting wrench includes a head having a circular groove in a side thereof, the circular groove does not extend throughout the head and receive a pawl and a switch member, a spring-receiving receptacle is defined in a bottom wall delimiting the circular groove and receives a spring and a ball, the ball presses against one of a left ball-retaining groove and a right ball-retaining groove of the pawl such that either ratcheting teeth for clockwise rotation or ratcheting teeth for counterclockwise rotation on the pawl restrains clockwise or counterclockwise rotation of the ratcheting D-head. Extending through the periphery of the ratchet wheel is a square hole that receives a return element and a positioning block. The return element and the positioning block move upward or downward in response to rotational movement of an arcuate groove of a push rod such that the positioning block is moved upward to an engaged state or moved downward to a disengaged state, thereby retaining the ratcheting D-head in the groove of the head of the ratcheting wrench or disengaging the ratcheting D-head from the groove of the head of the ratcheting wrench.

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Cited
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(以上各欄由本局填註)

發明
新型 專利說明書

(請先閱讀背面之注意事項再填寫本頁各欄)

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線

一、發明 創作名稱	中 文	棘輪扳手之棘輪D頭快速拆換構造
	英 文	
二、發明 創作人	姓 名	詹正章
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四、中文創作摘要 (創作之名稱: 棘輪扳手之棘輪D頭快速拆換構造)

本創作係在提供一種有關棘輪扳手之棘輪D頭快速拆換構造，其構造係在於：該棘輪扳手頭部之一側開剖設製有一未貫穿之圓槽，以供容置一嵌掣塊與一方向調節鈕，並於圓槽之底緣凹陷有一彈簧槽，可供置入彈簧及鋼珠者；且令該鋼珠恰可頂制於嵌掣塊左、右之凹弧珠槽中，俾能藉由方向調節鈕之撥轉，逕使嵌掣塊兩側之任一棘齒，對棘輪D頭產生正、逆方向之限制作用者；然於，棘輪D頭之棘輪面上，則貫穿設有一方形槽孔，係供置入一彈復元件及一定位塊之用，而該彈復元件與定位塊係受另一推桿其相對位置上凹弧槽之旋動作用，逕而形成上昇卡制與下降縮入之狀態，俾令棘輪D頭得以卡制或脫離於棘輪扳手頭部之溝槽限制，具有快速拆卸換裝各種不同規格棘輪D頭之實用性進步效益者。

英文創作摘要 (創作之名稱:)

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附註：本案已向

國(地區)申請專利、申請日期：

案號：

五、創作說明

一種棘輪扳手之棘輪D頭快速拆換構造，尤特指稱具有可以快速拆換、適用各種不同規格之棘輪D頭，俾能提供使用者僅須攜帶一枝棘輪扳手，即可隨意換裝各種棘輪D頭，增加棘輪扳手之使用範疇與便利性者。

<創作背景>

按以，目前市面所見之棘輪扳手，其棘輪D頭組大都皆係屬於固定之型態與構造，使用者在從事實際的工作時，必須攜帶多種不同規格、尺寸的棘輪扳手，以因應各種不同工作上的需求，而造成使用者攜帶上極大不便之顧慮者；同時，在實施定期的維修保養工作時，亦無法順利拆卸取出棘輪D頭，常令棘輪D頭發生鏽蝕損壞之情形，導致降低使用壽命與年限之缺失者。

有鑑於此，本創作人乃從事棘輪扳手之多年製造、生產的實務經驗累積，並投入大量的研究開發與創新改良之精神，企能提供一種可以有效解決上述習用棘輪扳手所存在既存弊端之本創作：棘輪扳手之棘輪D頭快速拆換構造者。

<具體實施例>

為使專精熟習此項技藝之人仕業者易於深入瞭解本創作之構造內容及所能達成之功能目的，茲列舉一具體實施例並配合圖式詳細介紹說明如下：

一種棘輪扳手之棘輪D頭快速拆換構造，請配合參閱第一圖所示：係本創作之立體分解示意圖。其構造主要係包括有：一棘輪扳手10、一嵌掣塊20、一方向調節鈕30、一C型扣環40、一彈簧S1、一鋼珠R1、一棘

五、創作說明

輪D頭50、一壓縮彈簧S2、一定位鋼珠R2、一推桿60、一彈復元件70、一定位塊80等元件所共同組合而成者；其中：

一棘輪扳手10，其本體大致具有一可供握持之把手11及一頭部12，而該頭部12係供裝置所有構件之主要部份，乃係在於頭部12之一側開剖設製有一未貫穿之圓槽121，並於該圓槽121之底緣凹陷設有一彈簧槽122者；再於頭部12之中心處貫穿設有一軸孔123，並於軸孔123車製設有一階緣124，以供另一棘輪D頭50之凸耳55得可嵌置其中（如A-A視圖所示），且令該軸孔123之底緣處，恰與上述圓槽121相互接通，再於較大軸孔123之壁面處，挖製設有一溝槽125者；

一嵌掣塊20，係成左、右對稱之塊體，兩側圓弧之底緣處各別設置兩相互延接之凹弧珠槽21、22，並於兩側圓弧之上方角緣處，分別設有一正向與一逆向之棘齒23、24，中央則陷落呈一圓弧凹面25；再於嵌掣塊20中心樞軸處，設有一長圓凹槽26者；

一方向調節鈕30，係成一圓盤狀，大小恰可蓋住上述棘輪扳手10之圓槽121，一側面突設有長圓凸柱31，係供插結於嵌掣塊20之長圓凹槽26中，另端面則向下延伸有一撥桿32，用以旋轉撥動該嵌掣塊20形成向左、向右或處於中央之位置，並於圓盤周處處剖設有一環溝槽33者；

一彈簧S1，具適當之彈力，並直接置入於上述棘輪

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五、創作說明

扳手 10 之彈簧槽 122 中者；

一鋼珠 R 1，係配合放置於彈簧 S 1 上，且令該鋼珠 R 1 恰可頂制於嵌型塊 20 左側或右側之凹弧珠槽 21、22 中者；

一 C 形扣環 40，乃係用來扣置於方向調節鈕 30 之環溝槽 33 中，俾在上述彈簧 S 1、鋼珠 R 1、嵌型塊 20 與方向調節鈕 30 依序裝入於棘輪扳手 10 之彈簧槽 122 與圓槽 121 之後，得具有銜制扣合之組合功用者；

一棘輪 D 頭 50，其前端乃係為一具有多種不同規格尺寸之工作頭 51，中段則為較大之棘輪 52（為一定之規格與尺寸者）；而該，棘輪 D 頭 50 之中心處係穿設有一軸孔 53，末端並延伸設有一凸耳 55，並於棘輪 52 面上之近接處，貫穿設有一方形槽孔 54 者；

一推桿 60，係成階段狀之桿體，末端桿段處凹陷有一珠槽 61，中間桿段相對應於上述棘輪 52 之方形槽孔 54 處，亦逐漸縮陷呈一圓弧凹槽 62，末端桿段處則凸大成一旋轉用之撥鈕 63 者；

一彈復元件 70，略具彈力，係供置入上述棘輪 52 之方形槽孔 54 中，並藉由推桿 60 之旋轉作用，令該彈復元件 70 得以隨著推桿 60 之圓弧凹槽 62，呈一上昇與下昇之動作者；

一定位塊 80，下端呈一軸桿狀 81，可以穿置於彈復元件 70 中，上端則呈一突出塊 82，逕可限制於棘輪扳手 10 之溝槽 125 中，並依彈復元件 70 之上昇或下降動作，形成卡制或脫離於溝槽 125 之狀態者。

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五、創作說明

藉由上述各元件所組成之本創作，乃係提供一種棘輪扳手之棘輪D頭快速拆換構造，請配合參閱第二、三、四圖所示：係本創作之棘輪D頭限制正、逆與無限制轉動示意圖。使用者可以左、右地調轉該方向調節鈕30之撥桿32，即可逕該嵌掣塊20左、右之凹弧珠槽21、22受限於下方之鋼珠R1，而使兩側之正向或逆向棘齒23、24，向上弧擺並對棘輪D頭50上之棘輪52產生正逆方向之限制作用者；然當，該嵌掣塊20處於中央狀態時，即未具有限制該棘輪D頭50之作用，以利於使用者拆換棘輪D頭50者。

請再配合參閱第五圖與第六圖所示：係本創作之棘輪D頭嵌制狀態與拆卸狀態示意圖。即當使用者欲拆換不同規格尺寸之棘輪D頭50時，僅須將推桿60之撥鈕63旋轉至圓弧凹槽62恰與彈復元件70相互吻合的位置，此時彈復元件70因為圓弧凹槽62所形成之空間，逕令彈復元件70與定位塊80同步下降，並使定位塊80脫離棘輪扳手10溝槽125之限制，逕可輕易取出整組之棘輪D頭50，俾能更換不同規格尺寸之棘輪D頭50（係包括一整組的棘輪D頭50、推桿60、彈復元件70、定位塊80等構件）者；而在裝入另一整組的棘輪D頭50時，僅須先將該組的彈復元件70與定位塊80調轉至推桿60其圓弧凹槽62相互吻合之位置處，使定位塊80沒入於棘輪52面內，即可順利將整組的棘輪D頭50置置於棘輪扳手10之軸孔123、124中，最後再調轉推桿60之撥鈕63，令圓弧凹槽62逐漸離開彈復

五、創作說明

元件70，並持續藉由推桿60中間桿段之撐抵作用，令彈復元件70產生向上彈復之力量，遂將定位塊80推入定位於棘輪扳手10之溝槽125中，即可完成組合之工作者。

經由上述所陳之本創作：一種棘輪扳手之棘輪D頭快速拆換構造，乃係經過本創作人實務製作完成之實物，並迭經多次反覆操作、測試之結果顯示，的確已經可以達到下列之預期功能目的：

1. 本創作提供使用者僅須攜帶一組棘輪扳手，並配合多種不同規格尺寸之棘輪D頭組，即可應付各種不同的使用狀況，減輕使用者攜帶多組棘輪扳手之負擔，同時增加棘輪扳手之適用範圍者。

2. 本創作在提供使用者實際從事拆換不同的棘輪D頭時，完全不需要其他工具之幫助，即可輕易地達成拆卸、更換之工作者。

緣此，本創作人業經普遍查訪市面上所販售之棘輪扳手，並未發現或曾見聞具有相同構造之產品，實已符合新型專利「首先創作」、「實用性」與「進步性」之成立要義，爰依專利法第九十五條之規定，向鈞局提出新型專利之申請。

(請先閱讀背面之注意事項再填寫本頁)

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五、創作說明

<圖式簡單說明>

第一圖：係本創作之立體分解圖。

第二圖：係本創作之棘輪D頭限制正轉動示意圖。

第三圖：係本創作之棘輪D頭限制逆轉動示意圖。

第四圖：係本創作之棘輪D頭無限制轉動示意圖。

第五圖：係本創作之棘輪D頭嵌制狀態示意圖。

第六圖：係本創作之棘輪D頭拆卸狀態示意圖。

<圖號說明>

- | | |
|----------------|--------------|
| 10. 棘輪扳手。 | 11. 把手。 |
| 12. 頭部。 | 121. 圓槽。 |
| 122. 彈簧槽。 | 123. 軸孔。 |
| 124. 階緣。 | 125. 溝槽。 |
| 20. 嵌型塊。 | 21、22. 凹弧珠槽。 |
| 23、24. 正、逆向棘齒。 | 25. 圓弧凹面。 |
| 26. 長圓凹槽。 | |
| 30. 方向調節鈕。 | 31. 長圓凸柱。 |
| 32. 撥桿。 | 33. 環溝槽。 |
| S1. 彈簧。 | |
| R1. 鋼珠。 | |
| 40. C形扣環。 | |
| 50. 棘輪D頭。 | 51. 工作頭。 |
| 52. 棘輪。 | 53. 軸孔。 |
| 54. 方形槽孔。 | 55. 凸耳。 |
| 60. 推桿。 | 61. 珠槽。 |
| 62. 圓弧凹槽。 | 63. 撥鈕。 |
| 70. 彈復元件。 | |
| 80. 定位塊。 | 81. 軸桿狀。 |
| 82. 突出塊。 | |

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六、申請專利範圍

1. 一種棘輪扳手之棘輪D頭快速拆卸構造，其構造係由：一棘輪扳手、一嵌掣塊、一方向調節鈕、一C型扣環、一彈簧、一鋼珠、一棘輪D頭、一壓縮彈簧、一定位鋼珠、一推桿、一彈復元件、一定位塊等元件所組合而成者；其特徵乃係在於：

一棘輪扳手，之頭部一側開剖設有一未貫穿的圓槽，係供設置嵌掣塊與方向調節鈕者；並於圓槽底緣凹設一彈簧槽，可供置入彈簧及鋼珠者；再於頭部之中心處貫穿設有一軸孔，並於軸孔處車製一階緣，以供穿置棘輪D頭之用，且令該軸孔之底緣，恰與上述圓槽相互接通，並於漸接處之壁上，環製設有一溝槽者；

一嵌掣塊，左、右對稱，兩側各呈圓弧狀，底緣相接處並設有左、右各一之凹弧珠槽，且令上述之鋼珠得以藉由彈簧之彈力，恰可彈止於左側或右之凹弧珠槽中者；然於頂緣處則分別設有一正向、一逆向之棘齒，中央則成一圓弧凹面，中心處另設置有一長圓凹槽者；

一方向調節鈕，恰可覆蓋住上述棘輪扳手之圓槽，一側面突設有長圓凸柱，可與嵌掣塊之長圓凹槽結合固定者；另一端面則向下延伸有一撥桿，用來撥轉帶動該嵌掣塊處於向左、向右或中央位置者；並於周處處設置有一環溝槽，乃係供做另一C形扣環扣結組合於圓槽中者；

一棘輪D頭，前端可為一具有多種不同規格、尺寸之工作頭，中段則為固定規格、尺寸之較大棘輪，末端並設有一凸耳，恰可穿置於棘輪扳手之階緣中，並與下方顯露之嵌掣塊相互接觸啮合者；而該，棘輪D頭之中心處係穿

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六、申請專利範圍

設有一軸孔，可供穿置另一壓縮彈簧、定位鋼珠及推桿者；並於棘輪面上恰與上述棘輪扳手之溝環對應位置處，縱向貫穿設有一方形槽孔，係可置入一彈復元件及一定位塊者；

一推桿，係成階段狀之桿體，中間桿段處恰與上述棘輪之方形槽孔對應處，逐漸縮陷呈一圓弧凹槽，用以形成容置彈復元件之適當空間者；末端桿段則凸大成一撥動用之撥鈕者。

2. 如申請專利範圍第一項所述的棘輪扳手之棘輪D頭快速拆卸構造，其嵌製塊係受方向調節鈕之左、右撥動，而使兩側之正向或逆向棘齒，向上弧擺並對該棘輪產生正方向或逆方向之限制作用，而當嵌製塊處於中央狀態時，即未具有限制該棘輪D頭旋動取出之作用者。

3. 如申請專利範圍第一項所述的棘輪扳手之棘輪D頭快速拆卸構造，該彈復元件與定位塊係受推桿其相對應處其圓弧凹槽之旋動作用，逕而形成上昇卡制或下降縮入之狀態，俾令棘輪D頭具有卡制或脫離於棘輪扳手溝槽限制之作用者。

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FIG: 1

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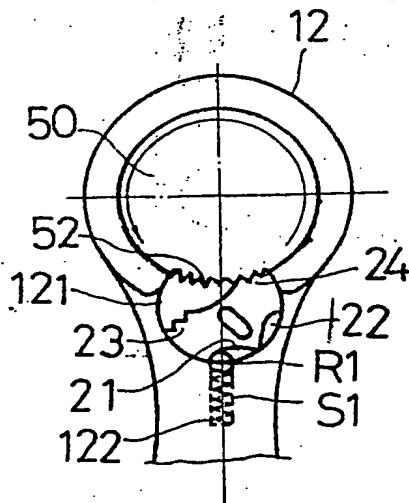


FIG. 2

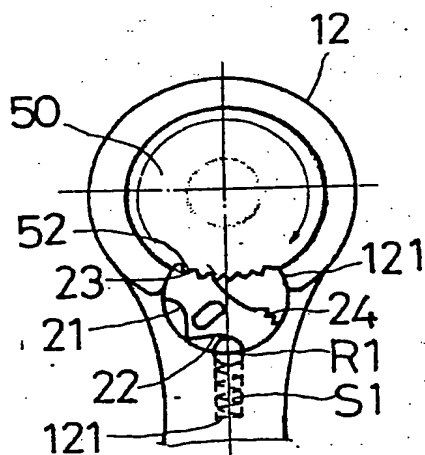


FIG. 3

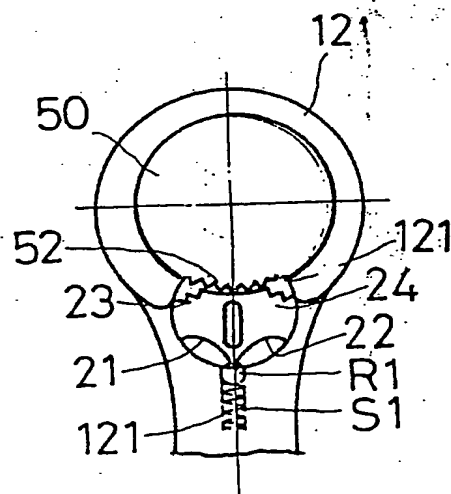


FIG. 4

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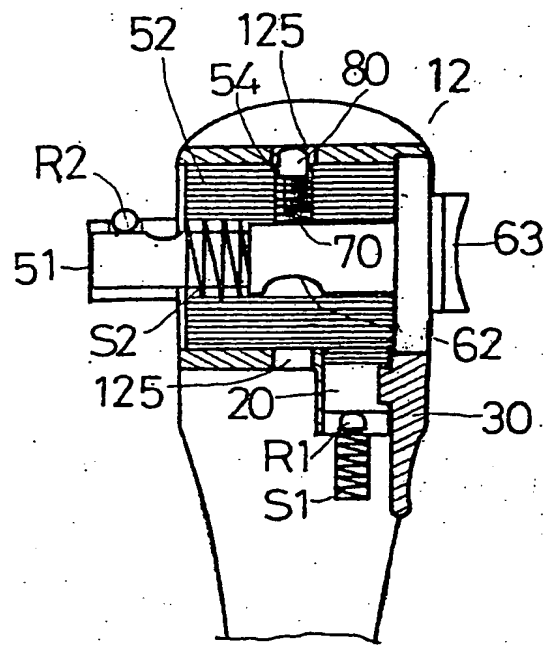


FIG: 5

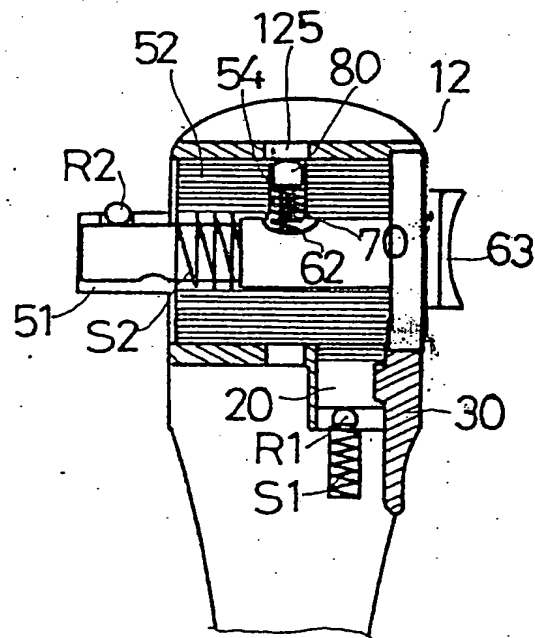


FIG: 6

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